

space must be routed as far as practicable from these spaces. As far as practicable, cables serving duplicated essential equipment must be separated so that a casualty that affects one cable does not affect the other. Existing cables and wires may remain as routed; however, any replacement wiring, new cabling and/or alterations must be routed as specified above.

(d) No unused or dead ended cables may remain after the permanent removal or alteration of an electrical device.

(e) Cable and wire for power and lighting circuits must:

(1) For circuits of less than 50 volts, meet 33 CFR 183.425 and 183.430; and

(2) For circuits of 50 volts or greater:

(i) Meet section 310-13 and 310-15 of NFPA 70, except that asbestos insulated cable and dry location cable must not be used;

(ii) Be listed by Underwriters Laboratories Inc. as UL Marine Boat or UL Marine Shipboard cable; or

(iii) Meet §111.60 of this chapter.

(f) All metallic cable armor must be electrically continuous and grounded to the metal hull or the common ground point at each end of the cable run, except that final sub-circuits (those supplying loads) may be grounded at the supply end only.

(g) Wiring terminations and connections must be made in a fire retardant enclosure such as a junction box, fixture enclosure, or panel enclosure.

(h) Existing cable and wire may remain in place and continue in use as long as it is deemed serviceable to the satisfaction of the Coast Guard Representative. Any new installation, replacement, modification or alteration must be done in accordance with the requirements of this section.

§ 28.870 Emergency source of electrical power.

(a) The following electrical loads must be connected to an independent emergency source of power capable of supplying all connected loads continuously for at least three hours:

(1) Navigation lights;

(2) Fire protection and detection systems;

(3) Communications equipment;

(4) General alarm system; and

(5) Emergency lighting;

(b) The emergency power source must be aft of the collision bulkhead, outside of the machinery space, and above the uppermost continuous deck.

(c) An emergency source of power supplied solely by storage battery must also meet the following requirements:

(1) Each battery must be a lead-acid or alkaline type and be able to withstand vessel pitch, vibration, roll, and exposure to a salt water atmosphere;

(2) A battery cell must not spill electrolyte when the battery is inclined at 30 degrees from the vertical;

(3) Each battery installation must be in a battery room, in a box on dock, or in a well ventilated compartment. The batteries must be protected from falling objects;

(4) Each battery tray must be secured to prevent shifting with the roll and pitch of the vessel and lined with a material that is corrosion resistant to the electrolyte of the battery;

(5) Each battery bank installation must be fitted with its own drip-proof charging system; and

(6) Each deck box used for battery storage must be weathertight, and have holes near the top to allow gas to escape.

§ 28.875 Radar, depth sounding, and auto-pilot.

(a) Each vessel must be fitted with a general marine radar system for surface navigation with a radar screen mounted at the operating station, and facilities on the bridge for plotting radar readings.

(b) Each vessel must be fitted with a suitable echo depth sounding device.

(c) Except as provided in 33 CFR §164.15, when the automatic pilot is used in areas of high traffic density, conditions of restricted visibility, and all other hazardous navigational situations, the master or person in charge shall ensure that:

(1) It is possible to immediately establish manual control of the unit's steering;

(2) A competent person is ready at all times to take over steering control; and

(3) The changeover from automatic to manual steering and vice versa is